

## **The Effects of Extensive Reading on Four Measures of Language Development in an Asian EFL Context**

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### **Abstract**

This quasi-experimental study investigates the impact of a program combining Extensive Reading (ER) and Intensive Reading (IR) on vocabulary acquisition, reading fluency, and proficiency in the reading, listening, and writing skills, in an Asian EFL context. Despite global evidence supporting ER's benefits, its implementation in EFL contexts — especially in Asian countries — remains limited due to institutional resistance, misconceptions about ER principles, and lack of teacher training. This study involved four groups of second-year English majors ( $n = 117$ ), randomly assigned to treatment and control groups at the class level. During each of the 15 weekly 150-minute sessions, both the control and treatment groups engaged in IR for 100 minutes; afterward, the two control groups continued with IR while the two treatment groups engaged in ER using level-appropriate graded readers. Statistical analyses revealed that the treatment groups made significantly greater gains across all measures compared to controls. These findings highlight ER's pedagogical value in developing multiple dimensions of language competence in under-resourced EFL contexts and emphasize the need for broader integration of ER into English language curricula.

**Keywords:** extensive reading, graded readers, reading speed, reading comprehension, vocabulary acquisition, language proficiency

Extensive Reading (ER) has been widely recognized as a highly effective approach to improving foreign language learners' reading fluency, vocabulary acquisition, and overall language proficiency (Day & Bamford, 1998, 2002; Robb & Ewert, 2024). ER prioritizes exposure to large amounts of comprehensible and engaging material to enhance fluency and natural language development (Grabe, 2009; Krashen, 2004). When reading extensively, the reader should choose a text that can be read fluently and comfortably to allow a predominant focus on the content rather than the language items contained in it. ER is less emphasized in most EFL classrooms than traditional Intensive Reading (IR) (also known as *study reading*). IR is a method of reading instruction to *teach the language* through explicit reading strategies and by explicit vocabulary and grammar learning through a detailed textual analysis.

Research has consistently demonstrated the benefits of ER across multiple dimensions (Robb & Ewert, 2024), including vocabulary acquisition (e.g., Webb & Chang, 2015), reading comprehension (e.g., Yamashita, 2008), and reading speed (e.g., Beglar & Hunt, 2014; Bui & Macalister, 2021; Suk, 2017; Tran & Nation, 2014). Reading fluency, which includes both reading speed and comprehension, is a critical component of language proficiency. ER has been shown to improve reading fluency by providing learners with ample opportunities to practice reading easy texts in a low-pressure environment (Grabe, 2009). Studies by Taguchi et al. (2004) and Beglar et al. (2012) have found that EFL learners who engage in ER exhibit faster reading speeds and better comprehension compared to those who rely solely on IR activities. These improvements are attributed to the increased exposure to print and the automatization of recognition stemming from reading easy materials comfortably. However, despite its established efficacy, the adoption and implementation of ER in EFL contexts, especially in the Southeast Asian region, remain woefully lacking (Puripunyanich & Waring, 2024). One reason for the lack of adoption is the dearth of empirical support to convince program designers to adopt ER into their programs. This study seeks to fill that gap by researching the effect of ER, in combination with IR, on fluency development, overall language proficiency as measured by a composite score of listening, reading and writing ability, and vocabulary acquisition in an EFL context.

## Literature Review

### Extensive Reading in Asian EFL contexts

Asian countries, e.g., Vietnam, South Korea, Indonesia, Thailand, etc., present a challenging context for English as a Foreign Language Learning and ER in particular, as English is not widely spoken in daily life, and learners often rely on formal instruction to develop their language skills (V. L. Nguyen & Dang, 2022; Renandya et al., 2021; Wisaijorn, 2017). English is a mandatory subject at both secondary and tertiary levels, with traditional teaching methods tending to emphasize grammar and vocabulary memorization. Reading instruction has traditionally centered on IR, with limited exposure to communicative practice or meaning-focused learning through ER (J. Park, 2015). The limited adoption of ER in Asian EFL contexts is largely attributed to these entrenched pedagogical practices, limited access to graded readers (Vuong et al., 2019), students' resistance to unfamiliar learning approaches (Baker & Nguyen, 2023) and a lack of awareness among educators regarding the main principles and best practices in ER (Arai & Takizawa, 2025; Fan, 2023; Waring & Vu, 2020).

Despite the challenging climate for ER in Asian EFL contexts, some recent research on ER programs offers promising insights into its potential for learners in this region. For example, studies in Vietnamese contexts have found that learners who engaged in ER showed improvements in reading comprehension (C. N. Nguyen, 2022), vocabulary recognition and reading speed (Pham et al., 2019), overall language proficiency (N. A. Nguyen, 2017) and demonstrated positive attitudes toward the ER program (T. T. H. Nguyen & T. T. V. Nguyen,

2020). Similarly, in the Indonesian context, Anandari and Iswandari (2019) reported a successful implementation of ER in Indonesian schools. Other studies in Indonesia (Katemba & Tomatala, 2024), China (Fan, 2023; He, 2014), Japan (Iwahori, 2008; Iwata, 2022; Junn, 2025), Korea (Jeon & Day, 2016; Kim & Ro, 2023; J. Park, 2016), Thailand (Jiraporn, 2022; Pongsatornpipat, 2022; Wisaijorn, 2017) also report benefits of ER for EFL learners' language development.

### **Vocabulary Uptake and Reading**

The relationship between reading and vocabulary acquisition in EFL contexts has been explored through a range of empirical studies. Vu and Peters (2023) for example, found that reading with textual input enhancement led to more vocabulary gains than reading-only (graded readers) or reading-while-listening. Pham (2023) conducted a quasi-experimental study comparing the effects of ER and IR on the vocabulary development of first-year English majors at university. Using pre- and post-tests, she found that while both groups improved, the ER group consistently outperformed the group doing traditional IR across all post-test vocabulary assessments.

These two findings seem to support the notion that ER, by providing repeated and meaningful exposure to lexical items, enhances vocabulary acquisition more effectively than traditional IR methods. However, it is important to note that although Vu and Peters (2023) and Pham (2023) stated they were using graded readers or doing *extensive reading*, no verification of these claims were made. Our view, following Waring and McLean (2015), is that students can only be considered to be reading extensively if it is demonstrated that the subjects are reading fluently and easily and with high comprehension. The simple use of graded readers in a study is no guarantee that this was how the subjects read because the books may have been too difficult. Nor was it established that the subjects self-selected the texts, or enjoyed them, which are other core tenets of ER. In both studies, books were purposefully selected to teach new words, thus the texts were likely to have been read intensively. From this we cannot conclude that the vocabulary gains made in these studies were due to ER.

However, other studies not conducted in EFL contexts do provide support for the vocabulary benefits of reading from studies using graded readers. Sakurai (2023) investigated ER's impact on controlled productive vocabulary among 62 English majors, revealing significant improvements in learners' ability to use new words in context, thereby highlighting ER's role in developing productive vocabulary skills. Similarly, Boutorwick et al. (2019) compared traditional ER with an ER-plus approach that incorporated post-reading discussions. Their findings indicated that while both methods facilitated vocabulary development, the ER-plus approach led to greater gains in semantic word associations, suggesting that integrating interactive elements can amplify the benefits of ER. Daskalovska's study (2018) emphasized that while explicit vocabulary instruction has its place, the majority of vocabulary growth occurs through exposure to ER materials, advocating for ER's inclusion in language programs. Liu and Zhang's (2018) meta-analysis of 21 studies involving 1,268 learners confirmed ER's significant positive effect on vocabulary acquisition, identifying a one-semester duration as optimal and highlighting the effectiveness of graded readers and supplementary exercises. Additionally, Klassen and Green (2019) explored the impact of ER duration on receptive vocabulary knowledge, finding that both short-term and long-term ER treatments yielded comparable gains, suggesting that even shorter ER interventions can be beneficial. A study by A. Park et al. (2017) compared the effects of ER and IR on vocabulary development among 72 Korean secondary EFL students over 12 weeks. Results showed ER led to significantly greater gains in word meaning and usage than IR, especially for intermediate and advanced learners while lower-proficiency students benefited more from IR. This highlights the need to tailor

reading approaches to learner proficiency. Collectively these studies show that ER can enhance vocabulary acquisition. However, there is little research into the effect of ER on vocabulary in the EFL context, which this study seeks to address.

### **ER and Its Effect on Language Skills**

The beneficial role of ER has also been found in a variety of contexts. Kim and Ro (2023), in a detailed analysis of young EFL learners' book reports, found that additive ER contributed significantly to the syntactic complexity and sophistication of learners' written output, suggesting a positive transfer of reading input to writing performance. Complementing this, J. Park (2016) argued for an integrated pedagogical approach that combines reading and writing through ER, reporting that such integration fosters greater learner engagement and results in measurable improvements in writing quality. Similarly, Mermelstein (2015) demonstrated through experimental research that an enhanced ER program can lead to substantial gains in EFL learners' writing, including improvements in content development, organizational structure, and language accuracy. While these studies focus primarily on writing, Iwahori (2008) provided evidence of ER's strong impact on reading fluency, documenting significant increases in reading speed and motivation among Japanese EFL students. More recently, Junn (2025) found a moderate correlation between total words read by participants in an ER program and their IELTS reading scores. His findings indicate that the subjects significantly improved their reading speed, although this aspect does not appear to have a significant correlation with changes in IELTS reading scores. Collectively, these findings underscore the multidimensional value of ER as an instructional tool for advancing both receptive and productive language skills in second language learning environments.

Despite the evidence supporting ER, some scholars have raised concerns about speed-focused reading approaches. For example, Carver (1992) argued that reading speed may improve at the expense of comprehension when learners focus primarily on reading quickly rather than meaning. Similarly, Rayner et al. (2016) cautioned that rapid reading may encourage superficial processing, which may limit deeper comprehension and critical engagement with texts. These criticisms are particularly relevant to EFL contexts where learners may already struggle with vocabulary and syntactic complexity. In such settings, an overemphasis on speed could potentially reinforce poor reading habits and undermine comprehension. However, proponents of ER argue that when learners read easy, enjoyable texts at a comfortable pace, fluency develops naturally without sacrificing comprehension (Nation, 2005; Rasinski, 2012). The present study therefore adopts a balanced view: while speed is an important outcome of ER, it should not be pursued at the expense of understanding. This study's design—combining ER with IR and measuring both speed and comprehension—aims to address this debate directly by examining whether fluency gains are accompanied by maintained or improved comprehension.

### **Research Gap and Study Objectives**

While several studies have explored the potential of ER in Asian EFL contexts (Anandari & Iswandari, 2019; Baker & Nguyen, 2023; Fan, 2023; Iwata, 2022; Jiraporn, 2022; Junn, 2025; C. N. Nguyen, 2022; J. Park, 2016; Wisaijorn, 2017), there is a need for more rigorous, large-scale research to establish its effectiveness and inform pedagogical practices. One essential element of this overall approach to the development of ER in the Asian EFL context is to investigate the effectiveness of reading fluency development among these learners in an ER setting. To date, this is a relatively unexplored area of research into reading in Asia and due to its crucial role in the development of overall reading ability, it warrants further research.

While previous research has established ER as an effective means of enhancing fluency, its effects on EFL learners remain underexplored. Given the unique challenges of English education in Asia, it is imperative to investigate whether an ER program can lead to measurable improvements in reading speed, comprehension, vocabulary acquisition, and language proficiency. Employing a quasi-experimental design, this study seeks to fill this gap by examining the impact of a program combining ER and IR on the development of language aspects among university students majoring in English. Specifically, the study explores the effects of ER on four measures of language development: vocabulary acquisition, reading speed, reading comprehension, and overall English language proficiency (as reflected in reading, listening, and writing performance). The findings of this study will provide valuable insights for educators and policymakers seeking to improve reading pedagogy in Asian EFL contexts.

## **Method**

### **Research Questions**

The study aims to answer the following questions:

**RQ1:** To what extent does ER in combination with IR affect vocabulary development compared to the traditional IR-only approach?

**RQ2:** How does ER in combination with IR influence overall English language proficiency, as measured by a composite test including reading, writing, and listening components, compared to the traditional IR-only approach?

**RQ3:** How does ER in combination with IR affect reading fluency, as measured by reading speed and comprehension, compared to the traditional IR-only approach?

By addressing these questions, this study seeks to contribute to the growing body of literature on ER and provide evidence-based recommendations for EFL pedagogy in the Asian EFL context.

### **Participants**

The participants involved in this study were second-year English-major students following Bachelor's English programs at a university in four intact classes. At the outset of the study, they were enrolled in a course entitled "Reading and Writing". Two sets of groups were randomly selected as controls (C1 and C2) or treatment (T1 and T2) groups.

Most of the participants were 21 years old at the time of the study and had been studying English for at least three years in high school. There were 36 subjects in Group C1, 38 in Group C2, 29 in Group T1, and 28 in Group T2 at the beginning of the study. However, by the end of the semester, four subjects from Group C1, three from Group C2, two from Group T1, and five from Group T2 did not attend the post-tests, leaving 32 participants in Group C1, 35 in Group C2, 27 in Group T1, and 23 in Group T2.

Before the pre-tests, all participants were provided with detailed information about the research and asked to sign a consent form. The researchers explained that participation was entirely voluntary and that their pre-test and post-test results would have no impact on their academic grades.

### **Instruments**

All the subjects took several pairs of pre- and post-tests. A vocabulary level test (VLT) was used to measure their vocabulary acquisition. Their language proficiency development was

assessed using an English language proficiency pre- and post-test while their reading fluency development was assessed through a reading fluency pre- and post-test.

The VLT used in this research was first introduced by Nation (1983), modified by Schmitt et al. (2001) and then recreated by Webb et al. (2017). The test contains five word-frequency levels (1000, 2000, 3000, 4000, and 5000) and utilizes a matching format with 10 clusters of 3 test items for each level. Within each cluster, subjects have to match one of three English words to one of six equivalent English words. The test was entered into a Google Form to be used in this study. This version was then piloted and adjusted based on the pilot participants' feedback (note that only technical errors were corrected; the content of the test itself remained the same). As the treatment group read a variety of graded readers it was not feasible to analyze to see if any of the items on the VLT appeared in the texts and factor that into the analysis.

The English language proficiency pre- and post-test (See Appendices A and B) were targeted at Level B1 on the Common European Framework of Reference. The tests contained items taken from the book "Cambridge English: Preliminary 7" (Cambridge University Press, 2013) and were organized into three parts: Reading, Writing, and Listening with a maximum total score of 75. To ensure the tests were suitable for the participants, both tests were piloted on a group of 31 subjects, who also followed the same university program as the participants but did not participate in the experiment. The results showed a good dispersion of levels among the pilot subjects, and it was determined the texts were suitable for the main experiment. The total mean scores were 61.93 (SD = 11.27) for the pre-test and 61.43 (SD = 12.61) for the post-test. Normality tests (Shapiro-Wilk) indicated that both test score distributions were normal, and Levene's test showed no significant difference in variances ( $p = .392$ ). A paired-sample  $t$ -test revealed no significant difference between the pre- and post-test scores ( $t = .342, p = .735$ ). The sign test further confirmed the absence of significant directional differences ( $p = .572$ ). This suggests that the two tests were equally difficult. The pilot testing also allowed for the correction of minor spelling errors in the test booklet prior to final printing.

The reading fluency pre- and post-test texts (See Appendices C and D) were adapted from Tran and Nation (2014)'s study and were piloted and adjusted for this population based on the subjects' feedback. Text A was used to assess the participants' reading fluency on the pre-test and Text B was used to assess the participants' reading fluency on the post-test. Both of the texts contained around 700 words and were accompanied by 10 comprehension questions.

In this study, participants in the treatment groups engaged in an ER program centered around a selection of 207 graded readers, which were carefully chosen to cater to the subjects' proficiency levels. Using the *Extensive Reading Foundation Grading Scale* 15% of the books were classified as beginner, 37% as elementary, 24% as intermediate, 17% as upper-intermediate, and 5% as advanced.

## Procedure

The study was conducted over a 15-week period which was considered sufficient following Liu and Zhang (2018) and Klassen and Green's (2019) findings. Before the experiment, the researchers met up with all the groups to explain the research aims and objectives. A week later, as the usual semester began, all groups sat the pre-tests, including the English proficiency test, reading fluency test, and vocabulary level test.

From the second week onwards, all the subjects met once a week for 150 minutes and used the textbook "Skillful Reading & Writing" (Rogers & Zemach, 2018) as their shared designated course material. A typical lesson of this kind involved standard IR activities such as learning vocabulary and doing reading exercises that tested aspects of the text itself and so on. The instruction for both treatment and control groups was identical for the first 100 minutes of each

class. In the final 50 minutes of each class, the treatment group did ER while the control group continued with IR activities. This allows for a direct comparison of the traditional IR only control groups and the traditional IR plus ER treatment groups. In order to equate the treatment and control groups in terms of activity types and time-on-task, no follow up activities other than the ER component were done in class, and no additional out of class reading or homework was assigned in any group.

During their designated ER time, the subjects in the treatment group were allowed to choose books from the ER library. As soon as the VLT results were analyzed, the researchers consulted the participants on what level might be suitable for them. The treatment groups were provided with an account on Mreader.org, a website hosted by the Extensive Reading Foundation that provides 10-item quizzes for each graded reader read and served as a check on how much was read. For each book, the system provided questions from a randomized selection of a bank of 20-30 items, so participants received different sets of questions even if they read the same book and served to negate any potential cheating. If a T1 or T2 subject passed a quiz (at a 60% correct rate), they received a cover of the book on their own homepage on the website and the number of words in the graded reader were added to their reading log.

Several measures were taken during the 15-week experiment to ensure the ER component was conducted appropriately. First, the students were allowed to choose books that they liked and read at their own pace. However, if a student seemed to read too slowly, the researchers would talk to them and provide consultation. The student might then be advised to choose an easier book, or to not read every single word carefully if that was the case. Second, the students were encouraged to read as much as possible, provided that they enjoyed the activity. Third, the students were instructed to read for meaning, not for learning grammar or vocabulary.

At the end of the semester, the participants in all control and treatment groups sat the post-tests.

## Results

The number of books and words read by each student can be counted in two ways when looking at the Mreader.org data. Firstly, we can count the number of words in each book for which an Mreader test was passed. However, it is fair to say that students would have read books but were not able to pass the test for which they were not given credit. The second way to count the words read includes these additional books in the word counts. The data show that the average student with a low total word count (under 15,000 words read) attempted 9 books. One reason their total amount read was low was that they tended to read lower-level books with shorter word counts. The subjects who read more (those reading 40,000-95,000 words in total) averaged 57,000 words from 9.15 books passed and 71,000 words in 11.38 books passed and not passed. Together, these data show that the average student across the treatment groups read 11 books which is almost a book a week if we do not include the first and last classes which we used for pre-and post-tests. This meets the common criteria for students in an ER program who are commonly expected to read ‘a book a week at their level’.

The data used to analyze participants’ improvement scores on the pre- and post-tests described above. First, we conducted a preliminary data analysis to select an appropriate statistical method. Shapiro-Wilk tests were performed to check normality of data for pre-tests and post-tests across all groups. The results did not show evidence of non-normality for data related to vocabulary and English proficiency (See Table 1), so we used ANCOVA tests to analyze these data. This method allows for the comparison of post-test scores while statistically controlling for any initial differences in pre-test scores, thereby providing a more accurate estimate of the treatment effect. Evidence of non-normality was found for data related to reading speed and reading comprehension, so we used the Robust Linear Model (RLM) for these variables. This

method accommodates non-normally distributed data and is flexible in handling different types of dependent variables and error distributions.

**Table 1. Shapiro Wilk Test Results of Data for Pre-tests and Post-tests Across Groups**

Variable	Group	N	P-value	W	Skewness
Pre-test vocabulary	C1	32	0.45	0.97	0.14
	C2	35	0.20	0.96	-0.43
	T1	27	0.83	0.98	0.04
	T2	23	0.47	0.96	0.13
Post-test vocabulary	C1	32	0.28	0.96	-0.17
	C2	35	0.08	0.94	-0.03
	T1	27	0.15	0.94	0.06
	T2	23	0.10	0.93	-0.28
Pre-test proficiency	C1	32	0.07	0.94	0.11
	C2	35	0.06	0.94	-0.90
	T1	27	0.50	0.97	0.02
	T2	23	0.24	0.95	-0.08
Post-test proficiency	C1	32	0.09	0.94	-0.69
	C2	35	0.15	0.95	-0.59
	T1	27	0.42	0.96	0.17
	T2	23	0.09	0.93	-0.63
Pre-test reading speed	C1	32	0.00	0.86	1.41
	C2	35	0.02	0.92	0.69
	T1	27	0.65	0.97	0.25
	T2	23	0.32	0.95	0.55
Post-test reading speed	C1	32	0.00	0.90	0.70
	C2	35	0.76	0.98	-0.03
	T1	27	0.14	0.94	0.34
	T2	23	0.03	0.90	0.47
Pre-test comprehension	C1	32	0.12	0.95	0.31
	C2	35	0.05	0.94	-0.47
	T1	27	0.07	0.93	-0.02
	T2	23	0.21	0.94	-0.31
Post-test comprehension	C1	32	0.11	0.95	0.50
	C2	35	0.05	0.94	-0.39
	T1	27	0.02	0.91	-0.79
	T2	23	0.03	0.90	-0.02

### Vocabulary Level

A one-way ANCOVA test was performed to explore the effect of *group* on the participants' post-test vocabulary scores. Preliminary analysis showed that the relationship between pre-test and post-test vocabulary scores was similar across all groups. It also revealed a strong positive correlation between the pre-test and post-test scores,  $r = 0.57$ .

**Table 2. Vocabulary Mean Scores for All Groups**

Group	N	Pre-test mean	Post-test mean	Adjusted post-test mean
C1	32	69.47	76.84	79.42
C2	35	74.20	78.66	78.31
T1	27	75.70	109.11	107.83
T2	23	76.13	98.48	96.93

After adjustment for the pre-test scores (See Table 2), there was a statistically significant difference in post-test scores between groups,  $F(3, 112) = 10.18$ ,  $p < .001$ , partial  $\eta^2 = .214$ . The group factor accounted for 21.4% of the variance in the post-test results, holding constant pre-test results. It was also indicated that the pre-test scores were significantly related to the post-test scores,  $F(1, 112) = 61.47$ ,  $p < .001$ , partial  $\eta^2 = .000$ . In other words, participants who started with higher scores tended to obtain better results.

**Table 3. Pairwise Comparisons of Adjusted Post-test Vocabulary Scores**

Comparison	Mean difference	95% confidence interval	p-value
C2 vs. C1	-1.11	[-16.48, 14.26]	.998
T1 vs. C1	28.42	[11.99, 44.84]	<.001
T2 vs. C1	17.52	[0.34, 34.70]	.044
T1 vs. C2	29.52	[13.43, 45.62]	<.001
T2 vs. C2	18.63	[1.76, 35.50]	.024
T2 vs. T1	-10.90	[-28.73, 6.94]	.387

Follow-up analyses were conducted to examine the pairwise differences among adjusted post-test means (See Table 3). We found that the adjusted means for Group T1 and Group T2 were both significantly higher than that of Group C1. As compared to Group C2, both Group T1 and Group T2 showed significantly higher adjusted means too. Meanwhile, the analysis found no significant differences between the adjusted means for Group T2 and Group T1 or between the adjusted means for Group C2 and Group C1.

These findings indicate that the treatment groups outperformed both control groups on the post-test and that the relationship between pre-test and post-test scores was similar across groups. Taken together, the results suggest that engaging in ER helps enhance vocabulary development.

### English Proficiency

Preliminary results from the one-way ANCOVA test showed that the relationship between the pre- and post-test scores did not differ significantly among groups. Instead, a moderate positive correlation was found between the pre-test scores and the post-test scores,  $r = 0.43$ . After adjustment for pre-test scores (See Table 4), there was a statistically significant difference in language proficiency post-test scores between groups,  $F(3, 112) = 30.09$ ,  $p < .001$ , partial  $\eta^2 = 0.446$  with the group factor accounting for 44.6% of the variance. The participants' pre-test language proficiency results were significantly related to their post-test language proficiency results,  $F(1, 112) = 54.69$ ,  $p < .001$ , partial  $\eta^2 = .328$ . This suggests that while starting proficiency levels had a moderate influence on the participants' final results, the type of instructional approach (i.e., ER in combination with IR vs. IR only) had a statistically significant impact on their post-test language proficiency.

Post hoc comparisons were performed to examine pairwise differences among the adjusted means of post-test language proficiency (See Table 5). The results found no significant differences between Group C2 and Group C1 or between Group T2 and Group T1. However,

significant differences were found between Group T1 and Group C1 as well as between Group T2 and Group C1. Moreover, both Group T1 and Group T2 significantly differed from Group C2.

**Table 4. Language Proficiency Mean Scores for All Groups**

Group	N	Pre-test mean	Post-test mean	Adjusted post-test mean
C1	32	36.88	42.92	43.50
C2	35	41.08	45.79	44.63
T1	27	37.34	54.76	55.15
T2	23	37.10	56.76	57.25

**Table 5. Pairwise Comparisons of Adjusted Post-test Language Proficiency Scores**

Comparison	Mean difference	95% confidence interval	p-value
C2 vs. C1	1.13	[-3.20, 5.45]	.905
T1 vs. C1	11.64	[7.02, 16.27]	< .001
T2 vs. C1	13.75	[8.91, 18.58]	< .001
T1 vs. C2	10.52	[5.99, 15.05]	< .001
T2 vs. C2	12.62	[7.87, 17.37]	< .001
T2 vs. T1	2.10	[-2.92, 7.12]	.695

These results indicate that the treatment groups' English proficiency significantly improved from pre-test to post-test while neither control group showed meaningful changes over time. This suggests that participation in the ER program was beneficial for both treatment groups compared to their counterparts.

### Reading Speed

A preliminary examination showed that the data for reading speeds were not normally distributed. Several unusually high or low scores were observed in the dataset, which may have contributed to the skewness. Therefore, we used the RLM to examine the impacts of *group* on post-test reading speeds while controlling for pre-test performance. This method is less sensitive to violations of normality and the presence of outliers in the error distribution as compared to ordinary least squares regression. Table 6 presents the descriptive statistics for pre-test and post-test reading speeds by the four groups.

**Table 6. Pre-test and Post-test Reading Speeds by All Groups Measured in Words Per Minute**

Variable	Group	N	M	SD	Min	25 <sup>th</sup> %	50 <sup>th</sup> %	75 <sup>th</sup> %	Max
Pre-test	C1	32	124.02	39.59	81.70	94.14	113.68	140.98	250.81
	C2	35	116.52	24.29	79.89	97.42	108.39	137.39	174.66
	T1	27	130.99	21.79	83.60	116.61	126.14	146.99	176.08
	T2	23	119.70	41.58	32.36	95.46	103.95	142.85	222.37
Post-test	C1	32	126.8	39.18	78.66	95.92	115.85	150.66	217.50
	C2	35	116.85	26.64	58.00	102.96	118.00	132.22	176.00
	T1	27	166.86	38.67	114.17	133.42	170.59	190.82	245.76
	T2	23	140.83	45.78	84.80	104.80	133.03	187.50	235.14

The RLM results (See Table 7) indicated a significant overall model effect, with a positive and statistically significant coefficient for pre-test reading speeds ( $b = 0.80$ ,  $z = 9.17$ ,  $p < .001$ ). This suggests that participants who obtained higher pre-test reading speeds tended to achieve higher post-test reading speeds. An additional model including interaction terms between group

and pre-test reading speed revealed no significant interaction between group and pre-test reading speed. This supports the assumption that the relationship between pre- and post-test reading speeds was consistent across groups.

**Table 7. Robust Linear Model Predicting Post-test Reading Speeds from Pre-test Reading Speeds and Group Membership**

Predictor	b	SE	z	p	95 % CI
Intercept	28.20	12.00	2.35	.019	[4.68, 51.72]
C2 vs.C1	-4.95	7.38	-0.67	.502	[-19.42, 9.52]
T1 vs. C1	31.07	7.88	3.94	< .001	[15.62, 46.51]
T2 vs. C1	16.61	8.23	2.02	.044	[0.48, 32.73]
Pre-test reading speed	0.80	0.09	9.17	< .001	[0.63, 0.97]

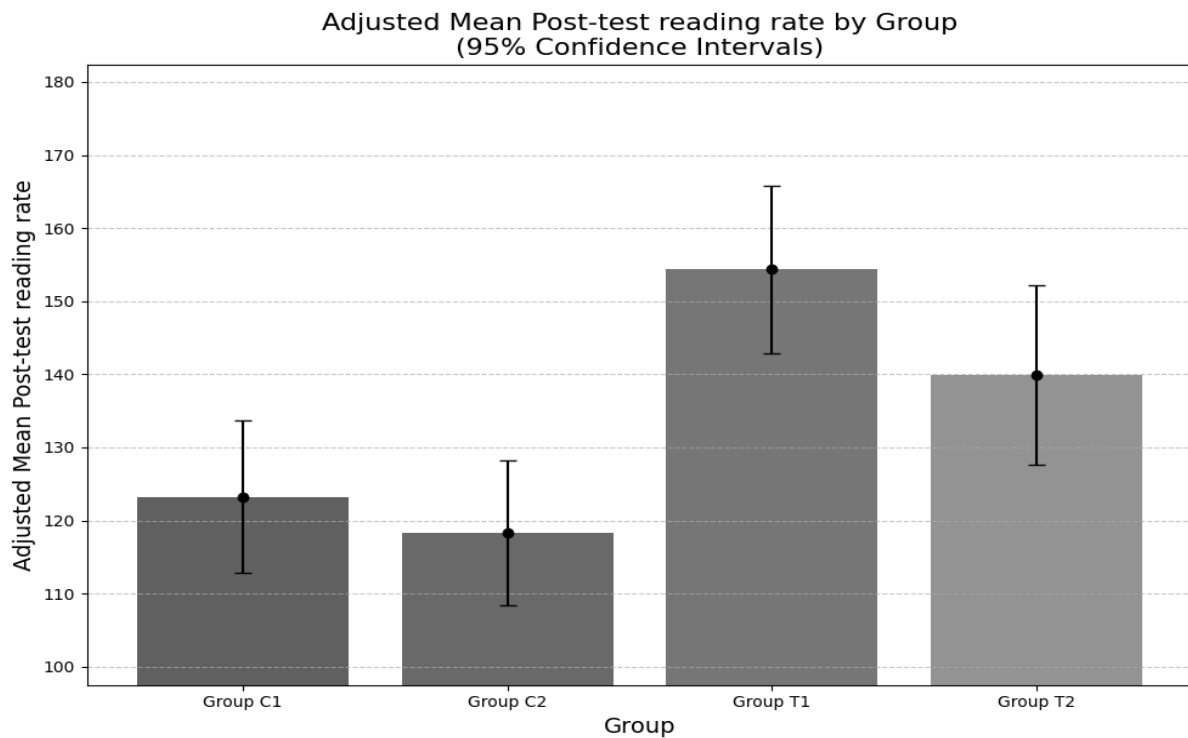
As can be seen from Table 7, compared to the reference group (C1), both Group T1 and Group T2 had significantly higher post-test reading speeds. By contrast, no significant difference was found between Group C2 and Group C1.

**Table 8. Post-Hoc Pairwise Comparisons of Adjusted Mean Post-test Reading Speeds**

Comparison	Mean difference	z	Uncorrected p	Bonferroni-Corrected p	Significant level ( $\alpha = .05$ )	Cohen's d
C1 vs. C2	4.95	0.67	0.5016	1.000	False	0.18
C1 vs. T1	-31.07	-3.92	0.0001	< .001	True	-1.13
C1 vs. T2	-16.61	-2.02	0.0436	.261	False	-0.61
C2 vs. T1	-36.02	-4.64	0.0000	< .001	True	-1.31
C2 vs. T2	-21.56	-2.67	0.0076	.045	True	-0.79
T1 vs. T2	14.46	1.68	0.0923	.554	False	0.53

Post-hoc pairwise comparisons using Bonferroni correction were performed to explore the differences across the groups on the post-tests (See Table 8). The results confirmed that there was no significant difference between Group C1 and Group C2. It was also revealed that there was no significant difference between Group T1 and T2. The comparisons found significant differences with large size effects between Group T1 and both Group C1 and Group C2. The difference between Group T2 and Group C2 was also significant. However, the difference between Group T2 and Group C1 was not significant after Bonferroni correction.

These results are visually supported by Figure 1, which presents the adjusted mean post-test reading speeds for each of the four groups with 95% confidence intervals. The overlapping confidence intervals between Group C1 and Group C2 suggest no significant difference in their adjusted post-test reading speeds. Meanwhile, the confidence interval for Group T1 does not overlap with those of either Group C1 or Group C2. The confidence interval for Group T2 does not overlap with that of Group C2 but shows minimal overlap with that of Group C1 at the lower end of Group T1 and the upper end of Group C2. Overall, it can be suggested that both treatment groups outperformed the control groups even after adjusting the pre-test reading speeds, but Group T1 demonstrated the most significant improvement in post-reading speed after adjusting for pre-test performance. This finding suggests that the ER program was effective in improving post-test reading speeds beyond what would be predicted by pre-test scores alone.



**Figure 1. Adjusted Mean Post-test Reading Speeds by Group (95% Confidence Intervals)**

### Reading Comprehension

Since the data for reading comprehension were not normally distributed, we used the RLM to examine the impacts of group on post-test comprehension while controlling for pre-test performance. The descriptive statistics for pre-test and post-test reading comprehension by the four groups are illustrated in Table 9.

**Table 9. Pre-test and Post-test Reading Comprehension by All Groups**

Variable	Group	N	M	SD	Min	25 <sup>th</sup> %	50 <sup>th</sup> %	75 <sup>th</sup> %	Max
Pre-test	C1	32	4.72	2.00	1.0	4.0	5.0	5.25	10.0
	C2	35	5.37	1.83	1.0	4.0	6.0	7.0	9.0
	T1	27	4.96	1.89	2.0	3.0	5.0	6.0	8.0
	T2	23	5.30	2.29	1.0	4.0	6.0	7.0	9.0
Post-test	C1	32	4.56	1.74	1.0	4.0	4.0	6.0	9.0
	C2	35	5.83	1.74	2.0	5.0	6.0	7.0	9.0
	T1	27	6.81	1.86	2.0	6.0	7.0	8.0	9.0
	T2	23	7.13	2.07	4.0	6.0	7.0	8.5	10.0

The RLM test (See Table 10) demonstrated a statistically significant overall model. The coefficient for the pre-test reading comprehension was positive and significant ( $b = 0.34$ ,  $z = 3.97$ ,  $p < .001$ ). This result indicates that participants with higher pre-test reading comprehension levels tended to have higher post-test reading comprehension scores. Compared to the reference group (C1), both Group T1 and Group T2 had significantly higher post-test reading comprehension levels. A significant difference was found between Group C2 and Group C1. However, after Bonferroni correction, this difference was not statistically significant anymore (See Table 11).

The RLM test found a significant interaction between group and pre-test reading comprehension. In other words, the effect of pre-test reading comprehension on post-test

reading comprehension is not the same across all groups, specifically Group T1 relative to Group C1 and pre-test reading comprehension ( $p = .044$ ). It seemed that the effect was stronger for students with lower pre-test scores while for those with higher pre-test scores, it might be smaller.

**Table 10. Robust Linear Model Predicting Post-test Reading Comprehension from Pre-test Reading Comprehension and Group Membership**

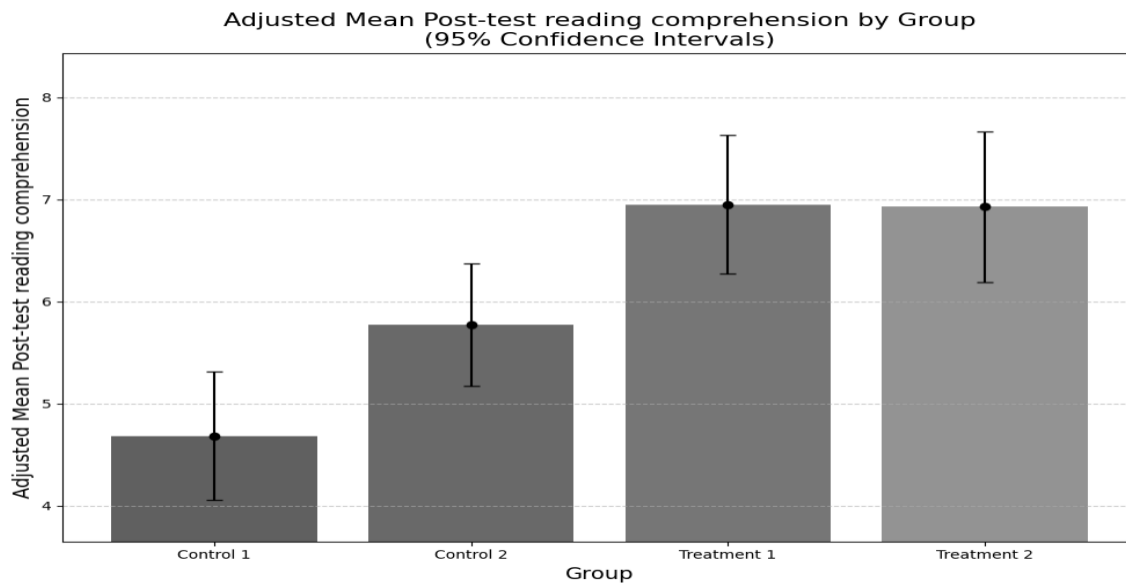
Predictor	b	SE	z	p	95 % CI
Intercept	2.96	0.51	5.75	< .001	[1.95, 3.97]
C2 vs.C1	1.09	0.44	2.45	.014	[-0.22, 1.96]
T1 vs. C1	2.27	0.47	4.80	< .001	[1.34, 3.19]
T2 vs. C1	2.25	0.50	4.53	< .001	[1.27, 3.22]
Pre-test comprehension	0.34	0.09	3.97	< .001	[0.17, 0.51]

We also conducted post-hoc pairwise comparisons using Bonferroni correction to examine the differences across the groups on the post-tests (See Table 11). The results showed no significant difference between Group C1 and Group C2 or between Group T1 and Group T2. The differences between the two treatment groups and Group C1 remained significant with large size effects. The difference between Group C2 and Group T1 or between Group C2 and Group T2 was not significant after Bonferroni correction.

**Table 11. Post-Hoc Pairwise Comparisons of Adjusted Mean Post-test Reading Comprehension**

Comparison	Mean difference	z	Uncorrected p	Bonferroni-Corrected p	Significant level ( $\alpha = .05$ )	Cohen's d
C1 vs. C2	-1.09	-2.46	.014	.084	False	-0.58
C1 vs. T1	-2.27	-4.79	< .001	< .001	True	-1.21
C1 vs. T2	-2.25	-4.54	< .001	< .001	True	-1.20
C2 vs. T1	-1.18	-2.54	.011	.067	False	-0.63
C2 vs. T2	-1.15	-2.38	.017	.105	False	-0.62
T1 vs. T2	0.02	0.04	.966	1.000	False	0.01

These results are visually illustrated in Figure 2. Group C1 had the lowest adjusted mean post-test reading comprehension, followed by Group C2. Group T1 and Group T2 both had the highest adjusted means, which suggests that they achieved substantially better results than the control groups on the post-test. The lack of overlapping between the confidence intervals of the two treatment groups and that of Group C1 indicates that they significantly outperformed Group C1. There was some overlap between the confidence intervals of the two treatment groups and that of Group C2, which suggests that although they did better on the post-test than Group C2, the difference is not statistically significant after correction.



**Figure 2. Adjusted Mean Post-test Reading Comprehension by Group (95% Confidence Intervals)**

All in all, the results showed that both treatment groups improved their reading comprehension to a greater extent than the control groups, suggesting that reading extensively might have enhanced the participants' reading comprehension.

## Discussion

The research aimed to examine the impacts of ER, when combined with IR, on university EFL learners' vocabulary development, English language proficiency and reading fluency. It was found that both treatment groups significantly improved their vocabulary scores from pre-test to post-test and achieved larger increases in vocabulary scores compared to the control groups. This is despite all groups having similar means on pre-test and a similar pre-to-post-test relationship reinforces the reliability of these findings. It can therefore be suggested that engaging in ER probably contributed to greater vocabulary development among the treatment participants compared to their control counterparts. While Klassen and Green (2019) found that vocabulary learning gains as a result of ER engagement were small in comparison to other published ER studies, the findings emerging from the present research are significant, both statistically and pedagogically. These findings are in alignment with those reported by Liu and Zhang (2018), Boutorwick et al. (2019), and Sakurai (2023).

Regarding English language proficiency, a similar trend was found. Both treatment groups demonstrated significantly higher scores than the control groups. Furthermore, the two treatment groups achieved significant gains from pre-test to post-test whereas the control groups showed no significant changes. The findings indicate that participants who engaged in ER substantially improved their English language proficiency, particularly reading, listening and writing skills. Previous research has reported the impact of ER on the development of writing ability (Kim & Ro, 2023; Mermelstein, 2015; J. Park, 2016) so these results are not unexpected. However, very little research has investigated the effects of this reading approach on general language proficiency. Therefore, the findings from this study contribute to the emerging literature in this area. Iwahori (2008) found that learners' scores improved just around 3%, however, the gains observed in our study were even greater: both treatment groups showed an increase of approximately 24%. This highlights the benefits of ER for EFL learners in developing English language proficiency.

Regarding reading speed, the data indicated that the four groups read at similar speeds at the beginning of the experiment, with group T1 having a slightly higher initial speed. However, after adjusting for the pre-test performance, Group T1 showed significantly faster speeds than both Group C1 and Group C2. Group T2 demonstrated significantly higher speeds than Group C2 but no significant difference was found between Group T2 and Group C1. However, the mean difference between these two groups (16.61 wpm) may still be considered pedagogically meaningful, even if not statistically significant. Taken together, the findings suggest that participants who followed the ER program improved their reading speed more than those who did not receive the treatment. This supports previous observations by Beglar and Hunt (2014), Bui and Macalister (2021), Suk (2017), and Taguchi et al. (2004). One possible explanation for the participants' speed improvement is that repeated exposure to common vocabulary and sentence structures and reading for meaning during ER may have helped them develop automaticity, which allows readers to process a text at a faster speed than when reading intensively.

In this study, it was found that the two treatment groups differed in reading speed, though not statistically, at both pretest and posttest, with T1 consistently outperforming T2. However, the consistent relationship between pre-test and post-test performance across groups suggests that the difference may reflect baseline variation rather than differential responsiveness to the ER intervention. Although both treatment groups improved relative to the control groups, the pre-existing advantage of T1 indicates that individual learner characteristics (e.g., language proficiency, prior reading experience, motivation, or reading habits) may have influenced outcomes. This highlights the importance of considering learner variables and ensuring comparable baseline performance in future studies, for example by measuring reading experience or administering a larger pretest battery.

While researchers skeptical of reading methods such as speed reading and ER worry about the trade-off between reading speed and reading comprehension (e.g., Carver, 1992; Rayner et al., 2016), this research has shown that this is not the case. Both treatment groups outperformed the control groups on the post-test, with significant differences observed between each treatment group and Group C1. Although the differences between the two treatment groups and Group C2 were not statistically significant, the mean difference - approximately 1.16 points relative to Group C1's mean of 5.37, or about 20% - can still be considered meaningful by language practitioners. The data in this study also showed that pre-test performance had a smaller influence on Group T1 compared to Group C1. Given that the adjusted mean for Group T1 was higher overall, it can be suggested that the treatment was especially effective for students who started with lower reading comprehension.

The findings in this study suggest that in reading fluency development, comprehension does not have to decline as speed increases as Carver (1992) had suggested. The findings corroborate those in Perfetti (2007) and Rasinski (2012), which suggest that reading speed can be improved without compromising comprehension. Perhaps the meaning-focus nature of ER might have contributed to the treatment groups' improvement as it frees learners from the need to analyze individual vocabulary and syntax, thus allowing them to engage with content more naturally and enhance comprehension. In addition, the participants' improvement in speed may have played a role in their comprehension gains. As some researchers (Grabe, 2009; Nuttall, 1996; Rasinski, 2012) have pointed out, one reason EFL learners struggle with comprehending texts is that they read too slowly. Ideas in texts are usually linked, often in such a way that requires readers to go beyond a single line or paragraph to fully understand a concept. Therefore, if learners read too slowly, they may strain the processing resources in working memory which are needed to be able to connect pieces of information, or link ideas in the text, which results in lower comprehension as they are restricted to the literal rather than interpretive level of

comprehension. Nation (2005) suggests that a reasonable goal for EFL learners is 250 wpm whereas all groups in this study read at speeds below 130 wpm on the pre-test. However, as the treatment groups improved their reading speed on the post-test, they were better able to connect ideas and make sense of the text. During the pre-test, all the participants were reading at a speed too slow for effective comprehension, but the treatment groups increased both their speed and comprehension scores on the post-test. We suspect that this is due to the addition of ER into their diet.

## Conclusion

Although the present study has withdrawn some encouraging findings, several limitations should be acknowledged. First, despite efforts made to ensure that the ER component reflected core principles of ER, such as self-selection and reading ease, individual differences in learners' motivation, reading strategies, and out-of-class exposure to English could not be fully controlled and may have influenced the outcomes. Second, while reading fluency was measured using both speed and comprehension, these measures were based on relatively short testing instruments administered at two time points; future research could benefit from longitudinal designs (e.g., repeated fluency assessments) to better capture learners' development path. Finally, although the study demonstrates positive short-term gains across several language dimensions, it does not address the durability of these gains over time. Longitudinal follow-up studies are therefore needed to determine whether the observed benefits of ER are sustained beyond the duration of the intervention.

In conclusion, there is a dire need in Asian EFL contexts to explore long-term outcomes backed by institutional investment in ER materials, teacher development, and curriculum integration which are essential to realize the full potential of ER in fostering fluent, confident, and motivated language users. As part of this initiative, this study provides additional evidence that carefully targeted ER can significantly enhance four measures of English language development among EFL university students: vocabulary acquisition, reading speed, reading comprehension and overall English language proficiency. Compared to the traditional IR instruction, subjects in the ER-IR treatment groups demonstrated gains in vocabulary acquisition, general language proficiency, reading speed, and, to a lesser extent, reading comprehension. These results support prior international findings on ER while offering new, context-specific insights for Asian educational settings, where ER remains underutilized. Despite logistical and institutional challenges, such as limited access to graded readers, lack of teacher training, and a prevailing exam-oriented culture, this study illustrates that well-structured ER programs, when implemented within ER principles, can yield meaningful linguistic improvements. These findings indicate that wider use of ER in Asian EFL contexts may contribute positively to language education.

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